2018 Grants: SMA

Fourth Grade Beetle Terrarium

Concept Statement: Fourth grade students will engage in scientific inquiry to determine the strength of a bess beetle and experiment with different surfaces to understand how traction and friction impact the beetle's pulling power.

Concept Description: Bess beetles are large harmless insects that have tremendous strength. In this activity 6 classes of 22, 4th grade students hitch a 'sled' to a bess beetle and research how much weight a beetle can move. They weigh the beetle and hypothesize how much weight it would be able to drag in a small sled across a flat surface. After determining the greatest pulled weight on a flat surface, they experiment with different materials to see whether they can further enhance beetle traction or reduce the friction of the sled on various substrates. In addition to this project, 2nd and 3rd grade students will observe these bess beetles and document observations regarding habitat, structures and functions, food source, life cycle, etc.

Project Goals and Objectives:

1. Purchase bess beetles kits during the first semester of the 2018-2019 school year.
2. Complete "Gaining Traction" project with 4th graders over three, one-hour class periods.
3. Share 4th grade student inquiry results on the school's morning news show.
4. 3rd grade students will observe the beetles in the fall of 2018 as part of their animal classification unit on vertebrates and invertebrates.

5. 2nd grade students will observe the beetles in the spring of 2019 to determine what habitat would meet the insects' basic needs. These students will also research the bess beetle's life cycle.

   Student Learning Objectives:

   4th grade students will be able to:

- Raise questions about the strength of insects and conduct team investigations through free exploration and systematic investigations, and generate appropriate explanations based on those explorations.
- Compare the observations made by different groups and seek reasons to explain the differences across groups.
- Explain that science involves the use of observations and empirical evidence.
- Attempt reasonable answers to scientific questions and cite evidence in support.
- Compare the methods and results of investigations done by other classmates.
- Keep records that describe observations made, carefully distinguishing actual observations from ideas and inferences about the observations.
- Recognize that scientists base their explanations on evidence.
- Explain that although characteristics of plants and animals are inherited, some characteristics can be affected by the environment.
- Compare surface materials based on their physical properties (texture).
- Investigate and describe that the speed of a bess beetle is determined by the distance it travels in a unit of time and that bess beetles will move at different speeds when the texture of the traveling surface changes.
- Measure the mass of bess beetles and other small objects.

- Understand how different variables (mass, friction, and force) affect the motion of an object.

2nd grade students will be able to:

- Recognize and explain that living things are found all over Earth, but each is only able to live in habitats that meet its basic needs.
- Observe and describe major stages in the life cycles of bess beetles

3rd grade students will be able to:

- Classify bess beetles according to their physical characteristics and behaviors.
- Identify the structures and functions of a bess beetle.

Project Budget:

- Carolina Biological Supply Company: Aquarium/Terrarium Ventilated Cover, for 1 1/2 gal #670389 6.25 x 2 = 12.50
- Rotting Wood #144153 8.75 X 2 = 17.50
- Bessbug Penny-Pull Kit #144145 48.50 X 3 = 145.50
- Item Total 175.50
- Shipping and Handling 27.55

2018 Funding: Requested amount $204. Fully funded.